



PATENT APPLICATION

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Toru YAMADA

Group Art Unit: 1792

Application No.: 10/582,802

Examiner: F. HITESHEW

Filed: June 14, 2006

Docket No.: 136170

For: VAPOR PHASE GROWTH APPARATUS AND METHOD OF FABRICATING
EPITAXIAL WAFER

REQUEST FOR RECONSIDERATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In reply to the April 21, 2009 Office Action, and the July 13, 2009 personal interview, reconsideration of the rejections is respectfully requested in light of the following remarks.

Claims 1-15 are pending in this application. Claim 1-15 are rejected under 35 U.S.C. §102(b) over Anderson et al. (U.S. Patent No. 5,916,369, hereinafter "Anderson"). The rejections are respectfully traversed.

The courtesies extended to Applicant's representative by Examiner Hiteshew at the interview held July 13, 2009, are appreciated. The reasons presented at the interview as warranting favorable action are incorporated into the remarks below, which constitute Applicant's record of the interview.

Anderson does not teach, and would not have rendered obvious, every claimed feature of independent claim 1. Anderson does not teach, and would not have rendered obvious, "the gas introducing gap is configured so that the length-to-be-formed thereof in the parallel

direction with the horizontal standard line is shortened in a continuous or step-wise manner as distanced from the horizontal standard line in the width-wise direction, or remained constant at any position," as recited in independent claim 1 (emphasis added).

The Office Action asserts that Fig. 7 of Anderson teaches portions of a gas inlet manifold 332, which supply gas to an upper zone of a processing chamber (Office Action, page 3). However, Anderson merely teaches portions of the gas inlet manifold 332 configured so that the length of the gap of the gas inlets increase as it is further distanced from a horizontal standard line in a width-wise direction (see Fig. 7 and col. 6, lines 1-10, of Anderson). Anderson does not disclose the length of the gap of the gas inlets being shortened or remaining constant as it is further distanced from the horizontal standard line in the width wise direction. Therefore, Anderson does not teach, and would not have rendered obvious, all of the claimed features of independent claim 1.

Anderson does not teach, and would not have rendered obvious, every claimed feature of independent claim 5. Anderson does not teach, and would not have rendered obvious, "so that the radius of the arc drawn by the inner periphery of the lower surface of the upper lining component is set larger than the radius of the arc drawn by the inner periphery of the top surface of the bank component," as recited in independent claim 5 (emphasis added).

The Office Action is silent regarding where Anderson teaches the above recited claim language. Further, Anderson does not disclose a radius of an arc R3 drawn by an inner periphery 40p of a lower surface of an upper lining component being set larger than a radius of an arc R1 drawn by an inner periphery 23p of a top surface of a bank component (see Fig. 7 of Applicant's specification). Therefore, Anderson does not teach, and would not have rendered obvious, all of the claimed features of independent claim 5.

The Applicant notes that a conventional vapor phase growth apparatus is configured so that a length of a gas introducing gap increases as it is further distanced from a horizontal

standard line in the width-wise direction (see Fig. 8 of Applicant's specification). The source gas introduced within the vapor phase growth apparatus tends to flow in a direction which allows a smaller friction resistance. Therefore, if the source gas flows in a direction approximately parallel to the horizontal standard line the flow resistance increases. Conversely, at a position farther from the horizontal standard line, the source gas can easily change its flow inwardly, where the flow resistance is small, around the exit of the gas introducing gap. As a result, it is difficult to achieve a uniform flow distribution in the width-wise direction of the source gas flowing on the silicon single crystal substrate. This results in the obtained epitaxial layer having an uneven layer thickness.

However, the configuration as recited in claim 1, "the gas introducing gap is configured so that the length-to-be-formed thereof in the parallel direction with the horizontal standard line is shortened in a continuous or step-wise manner as distanced from the horizontal standard line in the width-wise direction, or remained constant at any position," results in the flow resistance against the source gas being smaller than in a conventional vapor phase growth apparatus at a position distanced from the horizontal standard line (emphasis added). Also, a uniform flow distribution can be achieved in the width-wise direction of the source gas flowing on the silicon single crystal substrate. This configuration also results in a uniform flow route of the source gas around the periphery of the susceptor. Accordingly, it is allowed to realize a vapor phase growth apparatus capable of producing a silicon single crystal layer having excellent layer-thickness distribution.

Therefore, for at least these reasons, independent claims 1 and 5 are patentable over Anderson. Claims 2-4, 6-9 and 14 depend from independent claim 1, thus claims 2-4, 6-9 and 14 are also patentable over Anderson for at least their dependency on independent claim 1, as well as for the additional features they recite. Also, claims 10-13 and 15 depend from

independent claim 5, thus claims 10-13 and 15 are also patentable over Anderson for at least their dependency on independent claim 5, as well as for the additional features they recite.

Thus, Applicant respectfully requests withdrawal of the rejections.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



William P. Berridge
Registration No. 30,024

Michael D. Gagliano
Registration No. 62,037

WPB:MDG/add

Date: July 20, 2009

OLIFF & BERRIDGE, PLC
P.O. Box 320850
Alexandria, Virginia 22320-4850
Telephone: (703) 836-6400

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